

**FACULTY ATTITUDES, COMPUTER SKILLS, AND LEVEL OF USE OF
EDUCATIONAL TECHNOLOGY TOWARD ICT INTEGRATION IN HIGHER
EDUCATION MANILA, PHILIPPINES****Dr. Macario G. Gayeta**

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doc.aiyo@gmail.com**ABSTRACT**

Focusing on the assertion that the introduction of information and communication technology in higher education has become a major concern for many educators in developing countries, this study looked at faculty attitudes, computer skills, higher education technologies and developed a training program. Responses from one hundred and sixty-three respondents in three selected higher education institutions were collected using a mixed-method approach. The results show that faculty attitudes are optimistic in terms of excitement and competence, while anxieties about the use of technology show a positive attitude that gives rise to phases of adoption in classroom teaching. A list of faculty computer skills results in a high level of competence that demonstrates that the use of technology and training resources will improve the quality of higher education. The level of knowledge of education technology shows the value of curricula and curriculum design, while the importance of ICT in HEIs points to the importance of advanced teaching – classroom learning. The results of the study also indicate that there is no association between the level of importance of ICT in higher education and the form of higher education institutions, nor is there a significant age difference between faculty attitudes and computer skills. There is also no important link between faculty attitudes and computer skills in terms of teaching experience. Further research on ICT integration, such as the characteristics and cultural understanding of HEIs, should be investigated in order to provide a firmer basis for the in-service training program of faculty members.

Keywords: Computer skills, Faculty attitudes, Educational technology, ICT integration, Manila Philippines**INTRODUCTION**

It is widely known that the advent of information technology has renovated the higher education and business sector, investing in the field of information and communication technology. Higher education around the globe has established a position for technology transformation among students to fulfill the mandate to adapt and use technology in classroom settings. Teachers should be adept at this transformation of information and communication technology that affects the characteristics of faculty attitudes, computer skills and the use of education technology in higher education institutions.

According to Albion, Tondeur, Forkosh-Baruch, and Peeraer [1], the world has created a new form of technology through the development of ICT, while faculty members face new challenges as the 21st century unfolds in the pedagogical environment through the use of technology. ICT currently plays a key role in the transformation of the world economy and the creation of fast-paced innovation in society. Acceptance of ICT has led to a misconception that technology is one factor that can be used in both pedagogical environments for the changing environment of teachers.

Rastogi and Malhotra [2] argued that technology has an exceptional potential to innovate ways in which teachers can learn through the use of technology, provide a wide range of implementations that can transform the education system, innovate teacher-centered learning through outcome-based education, and

broaden the behavioral field of teachers. Leger and Freiman [3] stressed that the inventiveness of technology, digital empowerment, and thinking stand for the advancement of technology, and therefore technology must be used and taught in a powerful and meaningful way at higher education levels. Higher education ICT recognizes the need for students to have the skills to use new technologies. Krumsivik and Jones [4] argue that teachers should be prepared for innovation, higher level of thinking skills, and learning to be a leading role for students in the implementation of ICT in higher education. The main objective of the study is to investigate faculty attitudes, computer skills and the level of use of education technology in higher education. The general objective is twofold: (1) to investigate faculty attitudes, computer skills, and level of use of educational technology towards ICT integration in higher education in the Philippines and (2) to develop a training program for faculty members. Specifically, this study examined the factors that influence faculty attitudes towards ICT integration in classroom management. Lastly, it aimed to propose the In-Service Training Program (INSET) as a research-validated framework for ICT modules.

LITERATURE REVIEW

Faculty members of higher education should be prepared with the skills needed to be able to use ICT to compete with others in a globally competitive environment. Teachers are therefore expected to be competent in the use of ICT (Aslan & Zhu [5] Pineda [6]). Marcial and Dela Rama [7] have shown some evidence that ICT integration in higher education offers benefits for successful pedagogical learning. Bonifacio [8] argued that ICT integration has become an important consideration for many educators in developed countries and a key component of education.

Mercado, Domantay, Villacillo, Nisperios, and Pimentel [9] argued that the Republic of the Philippines recognizes the impact of ICT as evidenced by improvements in national education policies for HEIs. Marcial, Fortich, and Randal [10] argued that the integration of ICT into higher education is likely to reduce poverty in the Asia-Pacific region. Dotong, De Castro, Dolot, and Pineda [11] argued that there are still some teachers who resist and refuse to recognize the role of technology in the growth of learning skills, and there are others who have never been able to benefit from a lack of resources. ICT plays a crucial role in enhancing access to and delivery of government services in remote areas and in fostering open government and accountability. SEAMEO INNOTECH [12] reported that UN representatives had been monitoring and developing ICT integration skills in teaching and learning.

The results of Albarini [13] are parallel to those of computers, viable educational resources with the ability to bring about different changes in schools and classrooms. It also validates the findings of Knezek and Christensen [14] that the enthusiasm for using ICT for vocational training is slowing to grow. Gilakjani and Leong [15] have found that machine anxiety can lead to a large degree of negative attitudes and adversely affect the learning process of the faculty. However, Glifonea and Mayani [16] have shown a constructive outlook on ICT integration as they understand the benefits of ICT in the learning process.

Hismanoglu [17] also demonstrated that teachers also have decent ICT skills and a positive attitude. The Commission on Higher Education (CHED) [18] has envisaged that tertiary education would build a wide range of highly competitive human capital in the transformation of knowledge and information technology to enhance sustainable life in order to maximize poverty. The Higher Education Commission [19] has envisaged that tertiary education would build a wide range of highly competitive human capital in the transformation of knowledge and information technology to enhance sustainable life in order to optimize poverty reduction in the

country through sustainability. The Agendum of the Second National Higher Education Research Agenda II (NHREA) focuses on promoting awareness rooted in the creativity of tertiary education for quality higher education. On the other hand, the Rogers model of the Diffusion and Innovation Theory (DoI) has been proven among faculty members in leading universities in the Southeast Asian countries. Player-Koro [20] (2012) emphasized that attitudes also had a strong influence on how people interact as members of the organization. Roger's [21] (1995) Theory of Do I considers people adapting and choosing to use new innovations in the use of technology and people with positive attitudes and applied in a variety of disciplines, such as education, to explain how innovation is disseminated to members of the social system.

The main objective of the study is to examine faculty attitudes, computer skills and knowledge of higher education technologies. The overall objective is twofold: (1) to examine faculty attitudes and computer skills towards ICT integration in higher education in the Philippines and (2) to establish a training program for faculty members. Specifically, this study examined the factors that influence faculty attitudes towards ICT integration in terms of enthusiasm, anxiety and competence, and the level of computer skills of faculty members in classroom instruction. It also defined the extent of the use of education technologies by faculty members and the relationship between the degree of value of ICT. Lastly, the objective was to propose an action plan to enhance faculty attitudes and computer skills in HEIs and to establish a faculty of in-service training.

RESEARCH METHOD

The research used a quantitative-qualitative or mixed-method for collecting, evaluating, interpreting and reporting data from one hundred sixty-three faculty members as respondents. According to Creswell [22], the mixed-method aims at a deeper understanding of research problems and issues. The research involved two stages: collecting quantitative data and then collecting qualitative data to help clarify or expand quantitative findings. The survey strategy used for the quantitative part of the analysis is the survey questionnaire followed by the qualitative part of the survey strategy. Table 1 shows the demographic details of the three HEI respondents (N=163).

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Table 1. The HEIs as respondents

College/University	No. of Respondents
X Private College	51
Y Private University	56
Z Local/State University	56
Total	163

Pearson coefficient was used to assess whether there is a significant relationship between faculty attitudes and computer skills and age. A survey questionnaire was administered to gather data from the respondents. Part I deals with faculty attitudes consisting of 24 attributes adapted from Albarini [13]; Part II focuses on computer skills with 15 attributes adapted from Ndibalema [23]; and Part III focuses on knowledge of higher education technologies with 10 attributes adapted from Glifonea and Mayani [16]; Part IV focuses on the value of ICT in HEIs; and Part V focuses on demo graphics. Table 2 demonstrates the scale used to interpret the faculty attitudes and computer skills towards ICT integration.

Table 2. The scale used to interpret the faculty attitudes and computer skills towards ICT integration

Scale	Interpretation	Mean Range	Interpretation
5	Strongly Agree	1.00-1.49	Much competent/Very often/extremely important
4	Agree	1.50-2.49	Very competent/Often/very important
3	Neutral	2.50-3.49	Competent/Sometimes/Of average importance
2	Disagree	3.50-4.49	Little competence/Rarely/Little importance
1	Strongly Disagree	4.50-5.00	Not yet competent/Never/not important at all

Participating faculty members from three HEIs were asked whether they could agree to answer 16 open-ended questions. The researcher conducted a one-on-one interview for the qualitative part of the study. Interview data was collected and transcribed through a mobile data review recorder. The researcher has taken a dual step in the study of the data obtained. The quantitative analysis was evaluated using descriptive statistics. The data was collected, encoded and prepared for data analysis using SPSS. The mean, standard deviation, frequency and percentage scores were determined for each item in the questionnaire. The qualitative analysis was analyzed on the basis of transcripts of the semi-structured interviews conducted. The reliability figures are 853 (85.3%) with higher reliability. Chi-square was used to assess the relationship between faculty attitudes, computer skills and teaching experience.

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FINDINGS AND DISCUSSION

Faculty Attitudes towards ICT Integration

The result indicates the faculty attitudes towards ICT integration. The majority of respondents opted for things 7,8,13,14 and interpreted "agree" and received WM=4.47; SD=0.53.

Table 3. Faculty attitudes on enthusiasm

Statements	Mean	Std. Dev.	Description
1. The challenge of learning ICT is exciting.	4.49	0.76	Agree
2. I would like to spend more time using ICT.	4.14	0.89	Agree
7. I like learning about ICT.	4.52	0.71	Strongly Agree
8. If given the opportunity, I would like to learn about & use ICT.	4.64	0.59	Strongly Agree

Statements	Mean	Std. Dev.	Description
13. I think working with computers would be enjoyable and stimulating.	4.61	0.61	Strongly Agree
14. Learning about ICT is interesting.	4.55	0.74	Strongly Agree
19. I enjoy computer work.	4.34	0.84	Agree
20. Learning about ICT is boring to me.	1.53	0.93	Disagree
Overall	4.47	0.53	Agree

Qualitatively, in order to better explain the views of teachers on ICT, some of their comments are given: "I have a good outlook towards ICT integration. IT is a positive implication that faculty members are now ready to use computer technology in the classroom" (Professor 5, 45-year-old). Another respondent said, "I am quite passionate about the use of computer technology, although the implementation of ICT at the local university was poor, so I am providing my computer facilities and I have attended a training program to enrich my ICT skills" (Professor 12, 30 years old).

Qualitative research shows that the integration of ICT into HEIs has evolved. Some had a good attitude towards ICT, but some colleges did not have the ICT resources to prepare for classroom lectures. Albarini [13] found that teachers have a positive attitude towards ICT in education. The study also revealed a very strong relationship between teachers' attitudes towards ICT integration in education and their perception of computer attributes. In addition, Knezek and Christensen [14] (2002) have shown that enthusiasm for the use of ICT is slower to develop in terms of professional productivity and that other attitudes take longer to change in the timeframe of years rather than months.

On Anxiety

Table 4 illustrates the faculty attitudes toward ICT integration on anxiety. The majority of respondents chose items 3, 4, 9, 10, 15, 16, 21, and interpreted "disagree" and received a WM=1.80; SD=0.77. Qualitatively, the majority of faculty members are nervous about ICT and unprepared to use technology in teaching. "I used to be scared of computers before I bought my laptop. I used to think that if I click a letter or something else, I was spoiling something I don't know about. I soon realized that I needed to keep trying to use a machine, and there's nothing wrong with it if you want to be a computer literate. Now, my fear is gone, because I know how to run my laptop and get the data back from the web site" (Professor 8, 39 years old).

Table 4. Faculty attitudes on anxiety

Statements	Mean	Std. Dev.	Description
3. Working with a computer would make me very nervous.	1.72	0.92	Disagree
4.. I get a sinking feeling when I think of trying to use ICT.	1.89	1.08	Disagree

Statements	Mean	Std. Dev.	Description
9. Working with a computer makes me feel tense and uncomfortable.	1.64	0.97	Disagree
10. Computers frustrate me.	1.63	1.05	Disagree
15. I sometimes get nervous just thinking about ICT.	1.92	1.22	Disagree
16. I have avoided computers because they are unfamiliar and somewhat intimidating to me.	1.70	1.04	Disagree
21. I hesitate to use ICT for fear of making mistakes I cannot correct.	1.65	0.84	Disagree
22. I have a lot of self-confidence when it comes to working with computers.	2.22	1.07	Agree
Overall	1.80	0.77	Disagree

Computer anxiety can contribute to the negative attitude and influence of faculty members on psychological issues. Knezek and Christensen [14] (2002) revealed that anxiety tends to be reduced with significant exposure to ICT integration, hence, teacher having computer anxiety in classes could be a major factor that affect the quality of teaching and learning process of students (Bolandifar & Noordin [24] (2015).

On competence

Table 5 demonstrates the faculty's competency attitudes towards ICT incorporation. Things 11, 12, and 18 and read "strongly agree" and earned WM=4.41; SD=0.54 defined as "agree." Faculty competence in higher education, which has constructive attitudes towards technology adoption, could be observed. Qualitatively, teachers were asked if they felt ICT was a competence tool. "ICT will reshape the minds of teachers as the front lines of higher education. There's no such thing as you're afraid of computer technology integration. Teachers should stay ahead of their skills and continue to keep up with the changes taking place in higher education because someday teachers will not be able to teach unless they integrate technology into the classroom." (Singaporean Professor 1, 52). "ICT is important because it makes my job easier and the lessons are more interesting than the previous ones." (Professor 5, 45 years old). "I can also use a computer to find more interesting subjects for my lessons every day and make my presentation interesting" (Professor 15, 37-year-old).

Table 5. Faculty attitudes on competence

Statements	Mean	Std. Dev.	Description
5. ICT would stimulate creativity in students.	4.45	0.77	Agree
6. ICT would significantly improve the quality of my students' education.	4.48	0.67	Agree
11. ICT would motivate students.	4.55	0.65	Strongly Agree

Statements	Mean	Std. Dev.	Description
12. ICT can be useful instructional aid in my subject areas.	4.58	0.68	Strongly Agree
17. I think working with computers would be enjoyable and stimulating.	4.44	0.83	Agree
18. Learning about ICT is interesting.	4.53	0.71	Agree
23. Using ICT in teaching will only waste my teaching time.	4.33	1.01	Disagree
24. Using ICT to teach is just a passion.	3.90	1.26	Disagree
Overall	4.41	0.54	Agree

The faculty's competence is calculated by applying technology to teaching and learning in order to make learning in the classroom a good one. The educational use of ICT takes place in the teaching environment of teachers. Competence is also an essential part of the variables, as Marcial and Dela Rama[7] (2015) have pointed out that competence is enhanced by a higher level of knowledge and competence of school teachers, and Malaysian teachers are equipped with ICT skills and have a positive attitude towards providing student-based learning (Ghavifelr, Razak, Ghani, Meixi, & Tengyeu [25]) (2014).

Qualitatively, teachers were asked if they felt ICT was a competence tool. "ICT will reshape the minds of teachers as the front lines of higher education. There's no such thing as you're afraid of computer technology integration. "Teachers should stay ahead of their skills and continue to keep up with the changes taking place in higher education because someday teachers will not be able to teach unless they integrate technology into the classroom." (Singaporean Professor 1, 52). "ICT is important because it makes my job easier and the lessons are more interesting than the previous ones." (Professor 5, 45 years old). "I can also use a computer to find more interesting subjects for my lessons every day and make my presentation interesting". (Professor 15, 37-year-old). The faculty's competence is calculated by the application of technology in teaching and learning to make classroom learning a good one.

Faculty level of computer skills

Table 6 shows the faculty's programming skills. The faculty members improved their computing skills and interpreted "extremely competent" as $WM=3.79$; $SD=0.91$ as "very competent." The faculty members should know how to use appropriate technology in every subject taught today. Peralta and Adriano [26] (2011) found that the attitudes of teachers, computer skills, and the level of ICT integration in state colleges and universities have increased.

Qualitatively, the use of technology can be an advantage for educators, thereby enhancing the skills of all higher education faculties. "I'm in a position to learn several things using a computer. I can calculate grades using excel and use it as my e-class record" (Professor 14, 35-year-old). "There is a need to develop teacher/computer skills and classroom management with the advent of ICT for the sake of students. Teachers' use of ICT in private universities should be part of the ICT tool of each faculty member" (Professor 11, 55).

ICT researchers therefore believe that lack of adequate training, lack of knowledge and skills, lack of support for ICT leadership, lack of time and self-efficiency are obstacles to ICT deployment in higher education (Mirzajani, Mahmud, Ayub & Wong) [27]. (2015).

Table 6. Faculty computer skills

Statements	Mean	Std. Dev.	Description
1. I can operate a word processing program and type assignments for students.	4.17	0.89	Very competent
2. I can set up an LCD and use a visual presentation program for my students.	4.04	1.03	Very competent
3. I can operate a spreadsheet program.	3.67	1.17	Very competent
4. I can operate a database program.	3.15	2.65	Competent
5. I can install new software on a computer.	2.96	1.36	Competent
6. I can create a basic presentation package and print to a various networked printer for my lesson.	4.31	0.94	Very competent
7. I use the internet to ask and send the assignment to my students if possible.	4.33	0.85	Very competent
8. I can search the WWW to access different types of information.	4.10	1.19	Very competent
9. I can use a computer keyboard to typing my lesson plans.	4.40	0.81	Very Competent
10. Solve simple problems in operating computers.	3.55	1.19	Very Competent
11. I can operate a graphic program and organize them into folders.	3.30	1.38	Competent
12. I can use computers for the computation of grades of my students.	4.04	1.09	Very Competent
13. I can select and evaluate educational software to support teaching.	3.47	1.32	Competent
14. I can create and organize educational software for my students.	3.85	1.09	Very Competent
15. I can remove computer viruses.	3.32	1.33	Competent
Average Weighted Mean	3.79	0.91	Very Competent

Knowledge in Higher Education Technologies

Knowledge of higher education technology varies in all areas of teaching, presentation and management, with the aim of developing student learning and learning skills. Table 7 shows the experience of higher education technology. Average WM=3.73; SD=0.82 "often."

Table 7. Knowledge in Higher Education Technologies

Statements	Mean	Std. Dev.	Description
1. I can search for suitable ICT teaching materials.	3.81	1.00	Often
2. I can make my ICT teaching materials.	3.75	1.09	Often
3. I can use ICT materials to assist instruction in class.	3.88	0.94	Often
4. I can use the internet in class.	2.90	1.24	Sometimes
5. I can ask students to use computers to do homework or project.	3.43	1.14	Often
6. I can upgrade educational needs.	3.82	0.98	Often
7. I can use any educational method in facilitating learning.	3.86	0.87	Often
8. I can use the human invention.	3.43	1.08	Often
9. I can use the same technology applied in education.	3.68	0.87	Often
10. I am to utilize curriculum and instructional design in education.	3.87	0.89	Often
Average Weighted Mean	3.72	0.82	Often

Qualitatively, faculty members work with other faculty members to resolve common problems and share their teaching knowledge with other faculty members. "The use of a computer or laptop is very versatile at (our) university. Our classrooms are completely fitted with LCDs, so there is no reason for neglecting ICT integration. The use of laptops in the classroom could boost the pedagogy of teachers and save time for duplication of paperwork" (Professor 2, 48 years old). "I am a former high school faculty... there was no machine in the past. When I came to... I couldn't use the machine because I was scared. I need to learn how to use your computer. I can now operate a computer to measure the grades of my students" (Professor 15, 63 years old) On the other hand, "Integrating ICT into day-to-day teaching will make teachers more aware in practical ways" (Professor 11, 55).

The above-mentioned comments of faculty members view ICT integration favorably and that ICT facilitates rapid, efficient and effective learning and practicing. According to Kondabandelou, Selvaraju, Ken, Kewen, Yanm and Ning [28]. (2016) , that the use of computer technology can facilitate teaching in the classroom, and the government needs to promote the use of ICT in the classroom, and the use of ICT has also increased teaching and administration among the higher education faculty (Baldonado [29]) (2016).

Table 8. Relationship between faculty attitudes, computer skills, level of importance of ICT in higher education and type of HEIs

Variables	Chi-Square	df	p-value	Decision
Faculty attitudes	3.132	4	0.536	No significant relationship
Computer skills	16.163	6	0.013	There is significant relationship
Educational technology	6.280	6	0.393	No significant relationship
Levels of the importance of ICT	2.755	6	0.839	No significant relationship

**p<.05 (HO=Rejected); **p>.05 (HO=Accepted)*

Statistically, there is no relationship between faculty attitudes towards ICT integration, as seen in p-value=0.536, which is greater than 0.5. Table 8 also shows that knowledge of higher education technologies has acquired p-value=0.839. Only the faculty of computing skills has learned p-value=0.013. Thus, the null assumption is that there is no substantial association between faculty attitudes, computer skills, the level of value of ICT in HEIs, and the form of higher education. According to a memorandum published in line with the guidelines of the Commission on Higher Education, the development program provides the faculty members of higher education institutions with appropriate and relevant educational experience. The foundation of the Faculty Development Program for In-Service Teachers is threatened by the pedagogical excellence of ICT-based globalization of HEIs [29].

The researcher developed the following training programs to strengthen faculty attitudes and computer skills towards ICT integration in higher education in the Philippines. (1) the professional development of faculty members, which includes the promotion of knowledge exchange, study and teaching through radio and television; (2) the integration of ICT in lectures that enable the strategic formulation of the syllable of ICT integration among HEIs in Manila and the neighboring provinces to be disseminated; (3) Designing a learning environment that stimulates active learning to integrate effectively; requiring learners to develop awareness, skills, connect with peers to use presentation tools and digital resources to support instruction in the acquisition of subject matter. The module was designed to equip educators with the efficient and appropriate use of ICT in classroom discussions.

CONCLUSION

The following conclusions are drawn from the above findings of the study. The positive attitude of faculty members towards ICT integration at any level leads to better use of technology in the classroom and encourages other faculty members to apply more positive attitudes to technology. The faculty members have a high sense of responsibility for ICT integration. The use of ICT tools is of great value to the faculty of computer skills. Adequate time should be given to faculty members to develop new skills and incorporate these new advancements to improve technology-based instruction in colleges and universities. Improving the existing software design needed to ensure that faculty members are able to use multimedia software in teaching. This study adds originality to existing literature on ICT integration by presenting evaluations of private universities,

private colleges, and local or state universities. The results of this study provide useful insights and insights into ICT policy makers, college deans and the international research community by clearly depicting the strengths and weaknesses of the current implementation of ICT integration in the Philippines.

LIMITATION & FURTHER RESEARCH

The study is limited to a selected number of colleges/departments in private colleges and universities, state and local universities in higher education. Replication of this work is needed for future research and adds more variables such as attributes, cultural perceptions and attributes of ICT integration in ASEAN countries.

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